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TENNESSEE AIR POLLUTION CONTROL BOARD
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-1531



SIGNIFICANT MODIFICATION #1 TO

OPERATING PERMIT (TITLE V) Issued Pursuant to Tennessee Air Quality Act

This permit fulfills the requirements of Title V of the Federal Clean Air Act (42 U.S.C. 7661a-7661e) and the federal regulations promulgated thereunder at 40 CFR Part 70. (FR Vol. 57, No. 140, Tuesday, July 21, 1992 p.32295-32312). This permit is issued in accordance with the provisions of paragraph 1200-3-9-.02(11) of the Tennessee Air Pollution Control Regulations. The permittee has been granted permission to operate an air contaminant source in accordance with emission limitations, monitoring requirements set forth herein.

Date Issued: December 9, 1998

Date Modified: *****

Date Expires: December 9, 2003

Permit Number:

546586

Issued To:

Tennessee Gas Pipeline Company - Station 87

Installation Address:

208 TGT Road
Portland

Installation Description:

Natural Gas Pipeline Compressor Station:

Twenty-Two (22) natural gas fired reciprocating engines.

Two (2) natural gas fired emergency generator engines

Emission Source Reference No.: 83-0008

Renewal Application Due Date: Between March 14, 2003
and

Responsible Official: June 12, 2003

Name: David F. Jones

Title: Vice-President, Eastern Pipeline Operations

Primary SIC: 49

Facility Contact Person:

Name: Manish Singh

Title: Senior Environmental Specialist,
MSCE

Phone: (832) 676-7486

Information Relied Upon:

Significant Modification application dated August 1, 2002

(continued on the next page)

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TECHNICAL SECRETARY

No Authority is Granted by this Permit to Operate, Construct, or Maintain any Installation in Violation of any Law, Statute, Code, Ordinance, Rule, or Regulation of the State of Tennessee or any of its Political Subdivisions.

POST OR FILE AT INSTALLATION ADDRESS

SECTION E

SOURCE SPECIFIC EMISSION STANDARDS, OPERATING LIMITATIONS, and MONITORING, RECORDKEEPING and REPORTING REQUIREMENTS

83-0008	<u>Facility Description:</u>	Twenty-Two (22) lean-burn reciprocating natural gas fired engines including nine (9) 1100 Hp (10.12 MMBTU/hr) Cooper Bessemer GMV-10H engines, 1A through 9A, six (6) 1350 Hp (11.88 MMBTU/hr) Cooper Bessemer GMV-10HS engines, 1C through 6C, two (2) 2000 Hp (16.8 MMBTU/hr) Cooper Bessemer GMW-8 engines, 7C through 8C, two (2) 3400 Hp (28.56 MMBTU/hr) Cooper Bessemer GMWC-10 engines, 1D and 2D, one (1) 5500 Hp (46.2 MMBTU/hr) Cooper-Bessemer 16V-250 engine, 3D, two (2) 7700 Hp (47.8 MMBTU/hr.) Wartsila W18V34-SGD-C engines and two (2) natural gas fired emergency generator engines. (Horsepower replacement project to replace twenty (20) reciprocating engines and one (1) jacket water heater with two (2) 4-cycle, lean-burn reciprocating engines and two (2) natural gas fired emergency generators).
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- M2-1.** Each of the two (2) natural gas fired Caterpillar Emergency Generators, (Units 1EB and 2EB) shall not be operated in excess of 500 hours during all intervals of twelve consecutive months. This limitation is established pursuant to TAPCR 1200-3-6-.01(7) and the information contained in the application dated September 26, 2002.

Compliance Method: Compliance with this limitation shall be assured by maintaining a log which clearly shows compliance with the above condition. This log shall be retained for a period of not less than five years and shall be made available to the Technical Secretary or his representative upon request.

- M2-3.** Catalytic converters shall be utilized on Engines 1E and 2E, Wartsila W18V34-SG-C engines each rated at 7700 HP (ISO)

TAPCR 1200-3-27-.03(1)a

Compliance Method: Compliance shall be demonstrated by certification that catalytic reduction is utilized.

- M2-4.** Carbon monoxide emitted from Engines 1E and 2E, Wartsila W18V34-SG-C engines combined, shall not exceed 20 pounds per hour.

TAPCR 1200-3-7-.07(2) This limit is below the PSD significant emissions rate increment for this pollutant.

Compliance Method: Emission factor guaranteed from engine manufacturer with a catalytic converter and by certification that catalytic reduction is utilized.

- M2-5.** NOx emitted from Engines 1E and 2E, Wartsila W18V34-SG-C engines combined, shall not exceed 50 pounds per hour.

TAPCR 1200-3-7-.07(2) PSD netting resulted in a 157.4 tpy NOx reduction.

Compliance Method: Emission factor guaranteed from engine manufacturer using 4-cycle lean burn technology and by certification that lean burn technology is utilized.

- M2-6.** In addition to the added requirements and compliance methods shown in Conditions M2-1 through M2-6 above, the permittee shall comply with all terms and conditions of the Title V permit #546586 and any previous modifications.

END OF SIGNIFICANT MODIFICATION #1 TO PERMIT NUMBER: 546586

Permit Number: 546586
Significant Modification #1 *****

DRAFT

Expiration Date: December 9, 2003

Attachment #1

Supplemental Emission Factor Information

Tennessee Gas Pipeline Company

Natural Gas Speciation

<i>Chemicals</i>	<i>Mole Percent</i>	<i>Molecular Weight</i>	<i>Stream Molecular Weight</i>	<i>Weight Percent</i>
Propane	0.640%	44.0970	0.2822	1.64%
Isobutane	0.130%	58.1230	0.0756	0.44%
n-Butane	0.140%	58.1230	0.0814	0.47%
Isopentane	0.060%	72.1500	0.0433	0.25%
n-Pentane	0.040%	72.1500	0.0289	0.17%
Hexanes	0.040%	86.2060	0.0000	0.00%
Heptanes Plus	0.050%	100.2370	0.0501	0.29%
Methane	94.480%	16.0430	15.1574	88.09%
Ethane	2.600%	30.0700	0.7818	4.54%
Nitrogen	0.590%	28.0134	0.1653	0.96%
Carbon Dioxide	1.230%	44.0100	0.5413	3.15%
<i>TOTAL</i>	<i>100.00%</i>	<i>609.2224</i>	<i>17.2073</i>	<i>100.00%</i>
<i>TOTAL NM/NE HC</i>	<i>1.10%</i>	<i>491.0860</i>	<i>0.5614</i>	<i>3.26%</i>

BTEX Speciation:

<i>Chemicals</i>	<i>Weight Percent</i>
Benzene	0.0041%
Toluene	0.0029%
Ethylbenzene	0.0009%
Xylene	0.0012%

Emissions Factors for Emissions Inventories

Station: 87
Date Evaluated: 9/14/98
Period Considered for
Operated Averages: 1/1/95 to 9/1/98

UNIT	TYPE	RATED HP	AVE RPM	AVE HP	AVE % TORQUE	NOx (gr/ bhp-hr)	CO (gr/bhp-hr)
1A-10A, 1B-9B	GMV-10H	1100	300	1078	98	5.88	0.881
10B	GMV-10TF	1100	300	1067	97	9.086	1.42
11B	GMVGD-10	1300	300	1300	100*	16.131	0.744
1C-6C	GMV-10HS	1350	300	1282.5	95	13.175	0.501
7C-9C	GMW-8	2000	250	1788	89.4	13.038	1.05
1D-2D	GMWC-10	3400	250	3162	93	28.303	0.688
3D	16V-250	5500	250	5060	92	1.075	1.153

* No significant operating data due to low utilization, assumed 100% load since it is worst case for B.S. NOx

Sources:

1A-10A, 1B-9B - TGP Data 12/9/93, Sta 87, Unit 8A, Run 10 - used this vs. unit 7A because timing is closer to what we actually run (8 - 10 ° BTDC)
10B - TGP Data 9/28/93, Sta 219, Unit 5A, run 14
11B - TGP Data 10/1/93, Sta 219 Unit 7A, run 8 - this was a physically similar unit, although emissions appear much higher than unit 11B. Unit 11B data not to be used since engine has no individual fuel run
1C-6C - TGP Data 11/30/93, Sta 87, Unit 5C, Run 4
7C-9C - TGP Data 12/6/93, Sta 87, Unit 7C, Run 9
1D-2D - TGP Data 12/2/93, Sta 87, Unit 1D, Run 6
3D - TGP Data 7/25/95, Sta 219, Unit 1B, Run 6

Notes:

In all cases, data was chosen to best represent brake specific emissions rates for a similar or identical unit at operating conditions close to the typical conditions at this station.
To determine typical operating conditions at this station, averages were taken for a three to four year period from the TGP operating database (COMET). Brake specific emission rates should be valid for a relatively wide range of operation (when compared to mass rates) and should always be used with actual hp-hrs to determine total emissions output.
These rates do not need to be re-evaluated unless time - averaged long term operating conditions change, or better emissions data is obtained.

EMISSIONS CALCULATIONS
BASELINE EMISSIONS PROJECT
PORTABLE ANALYZER (DAI 6000)

STATION 87
UNIT NO. 7C
ENGINE TYPE C.B. GMW - 8
DATE 12/06/93

Ave
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RUN TIME	1 1:45 P	2 3:05 P	3 3:50 P	4 4:50 P	5 5:25 P	6 5:50 P	7 6:30 P	8 8:50 A	9 9:30 A	10 9:55 A	11 10:10 A
HORSEPOWER	1988	1990	1988	1990	1839	1923	2009	1991	1806	1902	2005
IGNITION TIMING	5	9.9	7.3	5	5	5	5	5	5	5	5
UNIT SPEED	250	250	250	250	230	240	250	250	250	250	250
HEAT RATE	7897	7682	7806	7954	8019	7990	7965	7948	8403	8144	7936
A/F RATIO (CALC.) *	41.56	43.49	42.50	42.03	42.50	41.56	42.03	42.03	43.49	42.50	41.56
MEASURED EMISSIONS											
NO PPM	1200	1370	1290	1210	1290	1270	1250	1180	955	1070	1230
NOx PPM	1348	1542	1442	1356	1444	1422	1398	1308	1055	1182	1362
NOx g/BHP-HR **	14.853	17.422	16.120	15.245	16.582	15.853	15.739	14.694	13.038	13.784	15.081
CO % OR PPM	178	118	152	186	160	200	238	178	140	158	198
%O2	13.1	13.5	13.3	13.2	13.3	13.1	13.2	13.2	13.5	13.3	13.1
CALCULATED EMISSIONS											
%CO2(WET) *	3.97	3.81	3.89	3.93	3.89	3.97	3.93	3.93	3.81	3.89	3.97
%CO2(DRY) *	4.37	4.17	4.27	4.32	4.27	4.37	4.32	4.32	4.17	4.27	4.37
%H2O *	9.02	8.69	8.86	8.94	8.86	9.02	8.94	8.94	8.69	8.86	9.02
%O2(WET) *	11.92	12.33	12.12	12.02	12.12	11.92	12.02	12.02	12.33	12.12	11.92
FUEL FLOW (SCFM)	278.52	271.22	275.33	280.82	261.63	272.59	283.90	280.75	269.25	274.80	282.28
EX. FLOW (LB/HR) **	32674	33367	33065	33330	31421	31978	33695	33321	33124	33002	33115
EXH. TEMP	750	725	750	760	740	750	755	755	740	755	755
AIR MAN PR.(PSIG)	1.6	1.6	1.6	1.6	1.4	1.5	1.6	1.6	1.6	1.6	1.6
SP. HUMIDITY(GRAINS)	60	60	60	60	60	60	60	60	60	60	60
FUEL DATA(PIPE I.D. = 3.068 in., ORIFICE = 1.125 in.)											
DIFF. ("H2O)	37.500	35.539	36.695	-38.078	32.898	35.836	38.906	37.883	34.859	36.352	38.398
PRESS. (PSIG)	53.688	53.813	53.813	54.063	54.250	54.063	54.063	54.250	54.250	54.250	54.250
TEMP.	73.969	74.969	75.781	76.125	76.125	75.938	75.844	75.219	76.031	76.313	76.500

** BASED ON DRY F-FACTOR CALCULATIONS
* BASED ON CARBON BALANCE (STOICH. + O2)
- A/F IS TOTAL MASS RATIO

EMISSIONS DATA SHEET - RECIPROCATING COMPRESSOR ENGINES

Shaded rows indicate raw data.

COMPANY	TGT
STATION	219
UNIT	1B
ENGINE TYPE	CB 16V250 CLEAN BURN
DATE	07/27/95

BORE	18 in.
STROKE	20 in.
RATED RPM	250 RPM
RATED BHP	5500 BHP
RATED BMEP	psi

RUN TIME	1	2	3	4	5	6	7		
	10:15 AM	6:15 PM	7:50	9:05 PM	9:25 PM	11:00 PM	12:15 AM		
HORSEPOWER	5473	4805	4894	4399	4399	5201	5552		
IGNITION TIMING (BTDC)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
UNIT SPEED	250	220	220	220	220	250	250		
% LOAD	99.5090909	87.3636364	88.9818182	79.9818182	79.9818182	94.5636364	100.945455	0	0
% TORQUE	0.08181818	0.09297521	0.09297521	0.09297521	0.09297521	0.08181818	0.08181818	ERR	ERR
HEAT RATE (BTU/HP-HR)	6797	6571	6724	6535	6525	6758	6703		
A/F RATIO *	56.59	59.88	59.88	61.07	56.59	54.58	55.57		
MEASURED EMISSIONS									
NO _x PPM	52	152	120	56	180	64	84		
NO _x PPM	80	172	132	68	208	84	120		
NO _x g/BHP-HR **	1.068	2.349	1.845	0.942	2.665	1.075	1.550		
NO _x LB/HR **	12.881	24.887	19.907	9.138	25.842	12.322	18.976		
CO ₂ PPM	160	120	120	136	120	148	140		
CO g/BHP-HR **	1.300	0.998	1.021	1.147	0.936	1.153	1.101		
CO LB/HR **	15.682	10.569	11.016	11.125	9.075	13.215	13.476		
%O ₂	15.5	15.8	15.8	15.9	15.5	15.3	15.4		
CALCULATED EMISSIONS									
%CO ₂ (WEI) *	2.86	2.06	2.06	2.06	2.06	2.06	2.06		
%CO ₂ (DRY) *	3.08	2.44	2.44	2.44	2.44	2.44	2.44		
%H ₂ O *	6.92	15.50	15.50	15.50	15.50	15.50	15.50		
%O ₂ (WEI) *	14.43	13.35	13.35	13.44	13.10	12.93	13.01		
FUEL FLOW (SCFM)	664.85	564.25	588.10	513.78	513.00	628.13	665.04		
EX. FLOW (LB/HR) **	106553	79937	83316	73693	70091	83832	89798		
EX. FLOW (DSCFM)	23616.70	27812.07	28987.65	25324.37	25286.02	30960.80	32779.87		
AIR FLOW (DSCFM)	56.59	59.88	59.28	119.57	ERR	ERR	ERR		
EXHAUST TEMP	661	637	654	626	649	675	675		
AIRMAN TEMP (F)	115	115	115	115	115	116	125		
AIRMANIPR (PSI)	13.3	11.5	11.9	9.7	8.3	11	13.2		
BAROMETRIC PR (HG)	27.79	27.75	27.75	27.75	27.75	27.75	27.75		
AMBIENT TEMP (F)	78	83	81	78	78	75	75		
SP. HUMIDITY (GRAINS)	60	60	60	60	60	60	60		
FUEL DATA									
DIFF. PRESSURE (H ₂ O)	55.929	40.398	43.726	33.429	33.281	50.492	55.914		
STATIC PRESS (PSI)	74.937	75.062	75.187	75.375	75.375	74.937	75.062		
FUEL TEMPERATURE	71.781	73.250	72.250	73.781	73.062	77.312	72.062		

** BASED ON FUEL SPECIFIC DRY F-FACTOR CALCULATION
* BASED ON CARBON BALANCE (STOICH. + O₂)
- A/F IS TOTAL MASS RATIO

EMISSIONS CALCULATIONS
BASELINE EMISSIONS PROJECT
PORTABLE ANALYZER (DAI 6000)

STATION 87
UNIT NO. 8A
ENGINE TYPE C.B. GMV - 10H
DATE 12/09/93

RUN	4	5	6	7	8	9	10	11	12	13	14
TIME	2:19 P	3:25 P	4:00 P	4:42 P	5:30 P	6:05 P	6:25 P	8:35 A	9:25 A	9:45 A	10:15 A
HORSEPOWER	1102	1023	1057	1103	1000	1051	1093	1106	1107	1100	1101
IGNITION TIMING	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	5.7	7.5	8.9
UNIT SPEED	300	280	290	300	300	300	300	300	300	300	300
HEAT RATE	7861	7868	8048	8108	8464	8351	8231	8201	8438	8298	8096
A/F RATIO (CALC.) *	41.11	42.26	41.56	40.67	42.99	42.50	41.56	41.34	39.02	39.83	41.56
MEASURED EMISSIONS											
NO PPM	466	334	418	500	256	350	456	528	518	512	548
NOx PPM	518	378	466	558	300	398	512	594	594	584	616
NOx g/BHP-HR **	5.610	4.231	5.233	6.155	3.685	4.760	5.880	6.754	6.494	6.432	6.958
CO % OR PPM	120	102	112	122	114	120	126	122	174	148	128
%O2	13	13.25	13.1	12.9	13.4	13.3	13.1	13.05	12.5	12.7	13.1
CALCULATED EMISSIONS											
%CO2(WET) *	4.02	3.91	3.97	4.06	3.85	3.89	3.97	4.00	4.22	4.14	3.97
%CO2(DRY) *	4.42	4.29	4.37	4.47	4.22	4.27	4.37	4.39	4.67	4.57	4.37
%H2O *	9.10	8.90	9.02	9.18	8.78	8.86	9.02	9.06	9.50	9.34	9.02
%O2(WET) *	11.82	12.07	11.92	11.72	12.22	12.12	11.92	11.87	11.31	11.51	11.92
FUEL FLOW (SCFM)	153.69	142.80	150.91	158.66	150.16	155.72	159.60	160.92	165.72	161.95	158.13
EX. FLOW (LB/HR) **	17823	17049	17704	18193	18250	18701	18723	18769	18186	18161	18551
EXH. TEMP	718	691	703	719	695	710	718	726	767	744	723
AIR MAN PR. (PSIG)	5	4.7	4.9	5	5	5	5	5	5	5	5
SP. HUMIDITY (GRAINS)	60	60	60	60	60	60	60	60	60	60	60
FUEL DATA (PIPE I.D. = 3.068 in., ORIFICE = 0.875 in.)											
DIFF. ("H2O)	31.383	27.078	30.281	33.602	29.977	32.258	33.898	34.516	36.586	34.859	33.156
PRESS. (PSIG)	55.813	55.813	55.813	55.625	55.813	55.813	55.813	55.813	55.938	56.063	56.188
TEMP.	84.125	84.594	84.688	84.688	84.688	84.594	84.500	85.219	85.500	85.563	85.563

** BASED ON DRY F-FACTOR CALCULATIONS
* BASED ON CARBON BALANCE (STOICH. + O2)
- A/F IS TOTAL MASS RATIO

Emissions Factors for Emissions Inventories

Station: 87 Auxiliaries
Date Evaluated: 9/14/98
Period Considered for
Operated Averages: 1/1/96 to 9/1/98

UNIT	TYPE	RATED HP	RATED KW	AVE KW	NOx (gr/ KW-hr)	CO (gr/KW-hr)
1A-4A	PVG - 8	370	250	144	29.3	2.37
1C	PVG - 8	370	250	141	29.3	2.37
2C - 3C	PVG - 8	370	250	141	1.48	3.01

Sources:

1A-4A, 1C - TGP Data 7/30/97, Sta 40, Unit 1A, Average of 3 runs
2C-3C - TGP Data 7/12/97, Sta 87, Unit 3C, Run 2, POST Catalyst Test

Notes:

In all cases, data was chosen to best represent brake specific emissions rates for a similar or identical unit at operating conditions close to the typical conditions at this station.

To determine typical operating conditions at this station, averages were taken for a three to four year period from the TGP operating database (COMET). Brake specific emission rates should be valid for a relatively wide range of operation (when compared to mass rates) and should always be used with actual hp-hrs to determine total emissions output.

These rates do not need to be re-evaluated unless time - averaged long term operating conditions change, or better emissions data is obtained.

07/24/95 11:53 412 662 1084

TENNESSEE GAS

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EMISSIONS CALCULATIONS
Enter data in shaded columns



87
AUX 3D
IR PVG-8
7/12-13/95

TIME	01	02	03
TIME	6:35 PM	6:55 PM	10:00 PM
NOISE LEVEL	226	196	177
VENTILATION FLOW (CFM)	14	14	14
UNIT HEATED	400	400	400
HEAT RATE (BTU/HP-HR)	13317	12392	13722
A/F RATIO *	16.67	16.67	16.59
MEASURED EMISSIONS			
CO ₂ (PPM)	220	150	36
NO _x (PPM)	240	160	38
NO _x g/BHP-HR **	1.657	1.028	0.269
NO _x LB/HR **	0.826	0.444	0.105
CO ₂ (PPM)	830	970	560
%O ₂	0.4	0.4	0.3
CALCULATED EMISSIONS			
%CO ₂ (WET) *	9.35	9.35	9.39
%CO ₂ (DRY) *	11.61	11.61	11.67
%H ₂ O *	19.46	19.46	19.53
%O ₂ (WET) *	0.32	0.32	0.24
FUEL FLOW (SCFM)	53.71	43.34	43.34
EX. FLOW (LB/HR) **	2638	2129	2120
EXHAUST FLOW	1020	1009	950
AIR MASS FLOW (LB/HR)	97	97	97
AIR MASS FLOW (GPM)	NA	NA	NA
EXHAUST FLOW (GPM)	NA	NA	NA
EXHAUST FLOW (GPM)	60	60	60

** BASED ON DRY F-FACTOR CALCULATIONS
* BASED ON CARBON BALANCE (STOICH. + O₂)
- A/F IS TOTAL MASS RATIO

SEMIANNUAL MONITORING-STATION 40 Auxiliary Units

STATION:	40 ORIFICE:	NOx PERMITTED (lb/hr):	39.61
UNIT:	#1 PIPE I.D.:	CO PERMITTED (lb/hr):	68.8
DATE:	07/30/97 SC:	ORIFICE TAP (1-UP, 2-DN):	NA
TESTED BY:	T. Scarborough	UDHV:	1037

ELAPSED TIME	RUN 1					RUN 2					RUN 3				
	ACTUAL TIME	NO (ppm)	NO2 (ppm)	CO (ppm)	O2 (%)	ACTUAL TIME	NO (ppm)	NO2 (ppm)	CO (ppm)	O2 (%)	ACTUAL TIME	NO (ppm)	NO2 (ppm)	CO (ppm)	O2 (%)
00:00	03:45	2540	192	380	2.8	04:25	2560	220	384	2.9	05:10	2680	232	380	3.1
00:02	03:47	2560	196	384	2.8	04:27	2580	218	380	2.9	05:12	2680	236	376	3.2
00:04	03:49	2620	200	388	2.8	04:29	2580	220	380	2.9	05:14	2680	236	376	3.2
00:06	03:51	2620	204	380	2.8	04:31	2560	220	388	2.9	05:16	2660	236	368	3.2
00:08	03:53	2640	208	382	2.8	04:33	2560	218	388	2.9	05:18	2660	236	368	3.2
00:10	03:55	2660	208	382	2.8	04:35	2580	220	384	2.9	05:20	2660	240	368	3.2
00:12	03:57	2660	212	388	2.8	04:37	2580	220	388	2.9	05:22	2660	236	384	3.2
00:14	03:59	2660	212	372	2.8	04:39	2560	220	380	2.9	05:24	2660	236	380	3.3
00:16	04:01	2660	212	380	2.8	04:41	2580	220	384	2.9	05:26	2600	236	372	3.3
00:18	04:03	2640	220	372	2.7	04:43	2580	218	376	2.9	05:28	2660	236	376	3.3
00:20	04:05	2660	216	372	2.7	04:45	2580	218	380	2.9	05:30	2540	232	384	3.3
AVERAGE (ppm)		2629.09	207.27	380.00	2.78		2572.73	219.27	382.91	2.90		2649.09	235.64	375.64	3.23

HP DATA	RUN 1	RUN 2	RUN 3
KW	180.00	184.00	170.00
GEN. VOLTS	478.00	478.00	480.00
GEN. AMPS	255.00	270.00	250.00
EXCITER VOLTS	53.00	53.00	53.00
EXCITER AMPS	32	33	32
HORSEPOWER	249	263	245
HEAT RATE	11981	11792	12038

FUEL DATA**	RUN 1	RUN 2	RUN 3
FUEL FLOW (scfm)	53.06	55.29	52.50

SUMMARY OF MASS EMISSIONS			
RUN	NO+NO2 (ppm)	CO (ppm)	CALCULATED NOx EMISS. (lb/hr)*
1	2836.36	380.00	11.24
2	2792.00	382.91	11.60
3	2884.73	375.64	11.59
AVERAGE	2837.70	379.52	11.48

*Calculations based on: F-factor = 8710 dsc/MMBtu
**Fuelflow based on manufacturers heatrate curves

CALIBRATION AND DRIFT					
NO	CYLINDER #	INITIAL RESPONSE	FINAL RESPONSE	DRIFT	%DRIFT
1	3952	3952	3965	13	0.33%
2	3952	3952	3970	18	0.45%
3	3952	3952	3969	17	0.43%
NO2	CYLINDER #	INITIAL RESPONSE	FINAL RESPONSE	DRIFT	%DRIFT
1	449	449	450	1	0.22%
2	449	449	446	3	0.67%
3	449	449	452	3	0.67%
CO	CYLINDER #	INITIAL RESPONSE	FINAL RESPONSE	DRIFT	%DRIFT
1	396	396	396	0	0.00%
2	396	396	396	0	0.00%
3	396	396	399	3	0.76%
O2	CYLINDER #	INITIAL RESPONSE	FINAL RESPONSE	DRIFT	%DRIFT
1	20.9	20.9	20.8	-0.1	-0.48%
2	20.9	20.9	20.9	0.0	0.00%
3	20.9	20.9	20.7	-0.2	-0.96%